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UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Cotton Division
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REPORT ON STUDY TO DETERMINE IF SAMPLES OBTAINED FROM OUTSIDE LAYERS REPRESENT THE QUALITY OF COTTON INSIDE BALES AFTER EXTENDED STORAGE

A pilot study was conducted recently by the Cotton Division of the Agricultural Marketing Service, U.S.D.A., to determine whether samples drawn from the outside of a cotton bale are representative of the quality of cotton inside the bale after storage for one year or more.

Samples from 1,611 bales of American Upland cotton and 150 bales of American Egyptian cotton were obtained from 53 mills in the Southeastern Area during the Spring of 1959. In addition to the usual portions from both sides of the bale, a third portion was drawn from a center layer when the bale was opened for processing at the mill. Only cotton from the 1957 crop or earlier was included. Information as to the exact year of production was not generally available, but indications were that most of the bales were from the 1957 crop and had been in storage approximately 20 months when the quality observations were made in June 1959.

The three portions of each sample were classed for grade. In addition, the center portion was measured for reflectance and yellowness on the Nickerson-Hunter Cotton Colorimeter. The two side portions were then measured on the Colorimeter and the color variation in yellowness was recorded in millimeters of deviation from the center portion.

It was found that the three portions were given the same grade by the classer in 70 percent of the American Upland bales. The portion from one side differed in grade from the center portion in 16 percent of the bales, and both side portions differed from the center portion in 14 percent of the bales. In bales where the center portion was assigned a grade different from that of one or both side portions, the center portion was assigned the lowest grade in 16 percent of the total and a side portion was assigned the lowest grade in 13 percent. Only 1 percent had one side portion higher and one side portion lower in grade than the center portion. The two side portions differed from each other in 19 percent of the bales.

The average deviation in yellowness of the two side portions from the center portion was + 1.10 millimeters. This indicates that the side portions were slightly more yellow on the average than the center portion, but the difference does not appear to be significant since there is a range of approximately 60 millimeters within a single grade.

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It was concluded from the study that samples drawn from a center layer and the two sides of American Upland bales after storage for at least 20 months do not show a significantly greater variation in grade than existed at the time of packaging. The grade of the center portion was the same as that of one or both side portions in 86 percent of the bales. Neither side portion was representative of the center portion in 14 percent of the bales, with the lower grade being found in the center portion approximately as often as in the side portions.

The 150 bales of American Egyptian cotton provided similar results.

Table 1. - Comparison of samples drawn from the two sides of a cotton bale with a sample drawn from a center layer of the bale, and with each other.

Method of Measurement and Degree of Variation	Am. Upland		Am. Egyptian	
	No.	%	No.	%
A. Grade designation uniformity by classer				
1. Same grade for three portions of sample	1,128	70	89	59
2. One side differing from center	262	16	34	23
3. Both sides differing from center	221	14	27	18
4. Total	1,611	100	150	100
B. Direction of grade variation within the bale				
1. Both sides higher than center	107	7	18	12
2. One side higher than center	144	9	17	11
3. One side higher and one side lower	15	1	0	0
4. One side lower than center	118	7	17	11
5. Both sides lower than center	99	6	9	6
C. Direction of color deviation (Hunter's + b degree of yellowness) of side portions				
1. Average net deviation from center	+ 1.10 mm.		+ 1.55 mm.	
D. Bales showing variation in grade between the two sides				
1. Difference of one-half grade	44	3	NA	NA
2. Difference of one grade	223	14	34	23
3. Difference of two grades or more	41	2	4	3
4. Total	308	19	38	26

NA - Not applicable.